

Broadway Boulevard, Euclid to Country Club

DRAFT REVISED INITIAL DRAFT PERFORMANCE MEASURE ASSESMENT OF DRAFT STREET SECTION CONCEPTS

June 11, 2013

Several revisions and updates have been made to the performance measure assessment table following the May 30th CTF meeting. These changes have been made in response to comments from the CTF at that meeting.

The attached revised table indicates new and revised performance measure assessments with **blue text** in the performance measure titles or the name of the street cross section concept. The notes on page 3 of the assessment table provide additional descriptions and detail regarding the assessments made, also in **blue text**. The new or revised performance measures are:

4a. Movement of Through Traffic: This assessment has been updated per the request of the Task Force. The Planning Team did the updated assessment based on two potential traffic growth projections, the base PAG projection "Future (PAG)" and the roughly 30% reduced traffic growth projection "Future (PAG Low)". The description of this assessment has also been updated on page 3 of the table, to reflect this updated assessment.

Several Transit Performance Measures (3c. Corridor Travel Time, 3d. Schedule Adherence, and 3f. Accommodation of Future High Capacity Transit): Given the change in assessment of through traffic, the Planning Team (with additional input for PAG and TDOT transit planners) updated the assessment of transit corridor travel time. These changes had an affect on the assessment of Schedule Adherence, additional evaluation of the high capacity transit provisions also affected this assessment. Finally, PAG and TDOT transit planners provided some additional input on the assessment of Accommodation of Future High Capacity Transit and some revisions have been made to the assessment of that performance measure.

Significant Resources: While reviewing materials since the May 30th CTF meeting, the Planning Team realized that the definition of performance measure 5a. Historic Resources did not allow for assessment of potential impacts to the other significant, but not historically eligible, resources that exist along Broadway. Therefore we have added this performance measure 5a'.

Assessment of the Southern Arizona Transit Advocates proposed cross section concept (Option 4+T SATA): The CTF asked that the Planning Team work with SATA to illustrate their concept in section drawings similar to those that have been prepared for the concepts that have been developed with the CTF. These sections and a descriptive cover memorandum are provided separately. A preliminary

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assessment of the SATA concept has been provided at the bottom of the table, and some additional descriptive text of assessment methodology has been added to page 3 of the table.

In addition, a couple of corrections have been made to the notes on page 3 of the table and these are in **red text**.


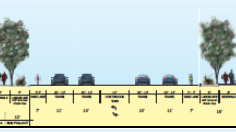
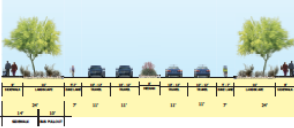
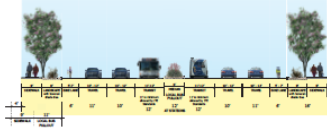
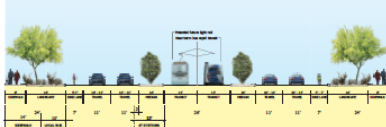
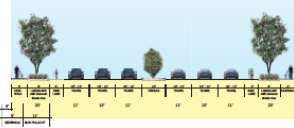
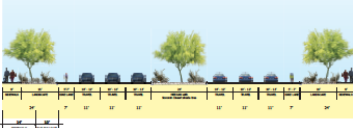

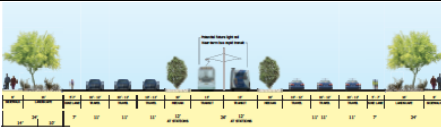
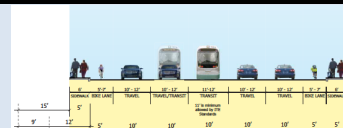
Note that as with the other performance measure assessments completed previously, these are provided as a starting point for consideration and review by the CTF.

The CTF meeting on June 20th will provide an opportunity to discuss these proposed revisions and updates.

BROADWAY: EUCLID TO COUNTRY CLUB INITIAL DRAFT PERFORMANCE MEASURE ASSESSMENT OF STREET CROSS-SECTION CONCEPTS

STREET CROSS-SECTION CONCEPT			PEDESTRIAN ACCESS AND MOBILITY									BICYCLE ACCESS AND MOBILITY							TRANSIT ACCESS AND MOBILITY							
		1a. Functionality of Streetside for Pedestrian Activity	1b. Separation from Vehicular Traffic	1c. Pedestrian-Oriented Facilities or Improvements	1d. Walkable Network / Neighborhood Connections	1e. Pedestrian Crossings	1f. Vehicle / Pedestrian Conflicts at Driveways		1g. Universal Design	1h. Walkable Destinations	1i. Ease of Transition to Walking	2a. Separation of Bikes and Arterial Traffic	2b. Bike Conflicts with Crossing Vehicles	2d. Pavement Condition	2e. Bike Facility Improvements	2f. Bike Network Connections	2g. Corridor Travel Time	2h. Bike Crossings	3a. Distance to Transit Stops	3b. Transit Stop Facilities	3c. Corridor Travel Time		3d. Schedule Adherence	3e. Frequency and Hours of Service	3f. Accommodation of Future High Capacity Transit	3g. Riders per Vehicle
Existing Conditions		-- to --	- to --	--		--	o to --					-	- to --		o to --			o to --		- to --	-- now -- Future (PAG) (PAG Low)		o to --		-	
Option 4A (67' r.o.w.)		--	--	--		++	-					-	o		+			++		+	-- Future (PAG)	-- Future (PAG Low)	--		-	
Option 4B (100' r.o.w.)		++	++	o		++	+					+	o		+			++		+	-- Future (PAG)	-- Future (PAG Low)	--		-	
Option 4C (112' r.o.w.)		+++	+++	++		++	++					+	o		o			++		++	-- Future (PAG)	-- Future (PAG Low)	-		-	
Option 4+T A (118' r.o.w.)		+	+	o		+	+					o	+		o			+		++	-- to -- Future (PAG)	- to o Future (PAG Low)	+		+++	
Option 4+T B (152' r.o.w.)		+++	+++	++		o	++					+	+		o			+		++	-- to -- Future (PAG)	- to o Future (PAG Low)	+		+++	
Option 6A (114' r.o.w.)		o	o	o		+	+					o	o		o			+		o	- Future (PAG)	o Future (PAG Low)	o		-	
Option 6B (152' r.o.w.)		++	++	++		+	++					+	o		o			+		+	- Future (PAG)	o Future (PAG Low)	o		-	
Option 6+T A (146' r.o.w.)		-	-	-		--	o					+	o		o			o		++	o Future (PAG)	++ Future (PAG Low)	+		++	
Option 6+T B (174' r.o.w.)		++	++	++		-	++					+	+		o			-		++	++ Future (PAG)	++ Future (PAG Low)	++		+++	
Option 4+T SATA (existing r.o.w.)		-- to --	- to --	--		++	-					-	o		+			++		++	-- Future (PAG)	-- Future (PAG Low)	-		o	

BROADWAY: EUCLID TO COUNTRY CLUB INITIAL DRAFT PERFORMANCE MEASURE ASSESSMENT OF STREET CROSS-SECTION CONCEPTS

STREET CROSS SECTION CONCEPT	VEHICULAR ACCESS AND MOBILITY							SENSE OF PLACE						ENVIRONMENTAL / PUBLIC HEALTH				ECONOMIC VITALITY							PROJECT COST							
	4a. Movement of Through Traffic	4b. Intersection Delay -- Overall Intersection Performance	4c. Intersection Delay -- Worst Movement	4d. Accident Potential	4e. Lane Continuity	4f. Persons Trips	4g. Access Management for Adjacent Properties	5a. Historic Resources	5a'. Significant Resources	5b. Visual Quality	5c. Broadway as a Destination	5d. Gateway to Downtown	5e. Conduciveness to Business	5f. Walkable Community	5g. Certainty	6a. Greenhouse Gases	6b. Other Tailpipe Emissions	6c. Heat Island	6d. Water Harvesting	6e. Walkability / Bikeability	6f. Land Use Mix	6g. Affordability	7a/7b Change in Economic Potential	7c/7d. Change in Business Revenue	7e/7f Change in Sales Tax Revenue	7g/7h Change in Property Tax Revenue	7i. Business Impact	7j. Job Impact	8a. Construction Cost	8b. Acquisition Cost	8c. Income for Reuse of City-Owned Parcels	
Existing Conditions	<div>— now</div> <div>Future (PAG) (PAG Low)</div>							+++	+++	○ to ---		— to ---		— future	—			○	---	—										\$	\$	
Option 4A (67' r.o.w.) <div></div>	<div>Future (PAG)</div> <div>Future (PAG Low)</div>							+++	+++	○ to ---		— to ---		—	--			○	---	○ to —										\$\$	\$	
Option 4B (100' r.o.w.) <div></div>	<div>Future (PAG)</div> <div>Future (PAG Low)</div>							++	++	—		--		○	—			+	--	○										\$\$	\$\$	
Option 4C (112' r.o.w.) <div></div>	<div>Future (PAG)</div> <div>Future (PAG Low)</div>							+	+	○		—		+	—			++	++	+										\$\$	\$\$\$	
Option 4+T A (118' r.o.w.) <div></div>	<div>— to Future (PAG)</div> <div>— to ○ Future (PAG Low)</div>							○	○	○		○		+	○			+	—	+										\$\$\$	\$\$\$	
Option 4+T B (152' r.o.w.) <div></div>	<div>— to Future (PAG)</div> <div>— to ○ Future (PAG Low)</div>							--	--	+		+		○	○			++	++	+										\$\$\$\$	\$\$\$\$	
Option 6A (114' r.o.w.) <div></div>	<div>○ Future (PAG)</div> <div>○ Future (PAG Low)</div>							○	○	+		+		○	○			+	○	○										\$\$\$	\$\$\$	
Option 6B (152' r.o.w.) <div></div>	<div>○ Future (PAG)</div> <div>○ Future (PAG Low)</div>							--	--	++		+		○	+			++	++	○										\$\$\$	\$\$\$\$	
Option 6+T A (146' r.o.w.) <div></div>	<div>○ Future (PAG)</div> <div>○ Future (PAG Low)</div>							--	--	○		+		—	++			○	○	○										\$\$\$\$	\$\$\$\$	
Option 6+T B (174' row) <div></div>	<div>○ Future (PAG)</div> <div>○ Future (PAG Low)</div>							--	--	○		++		○	+++			+	+	○										\$\$\$\$	\$\$\$\$	
Option 4+T SATA (existing r.o.w.) <div></div>	<div>Future (PAG)</div> <div>Future (PAG Low)</div>							+++	+++	○ to ---		— to ---		○ to —	—			○	---	○ to —										\$\$\$	\$	

BROADWAY: EUCLID TO COUNTRY CLUB INITIAL DRAFT PERFORMANCE MEASURE ASSESSMENT OF STREET CROSS-SECTION CONCEPTS

NOTES REGARDING CURRENT ASSESSMENT METHODOLOGY

For all new design options, assumption is a 30 mph design speed and posted speed.

1a. Functionality of Streetside for Pedestrian Activity: ITE Manual Guidance for Boulevard Street type (25-35 mph with 4-6 lanes, for various context types, see document for definitions)

- C-4 with predominantly commercial ground floor – 1.5 ft. edge, 7 ft. furnishings (including landscape), 8 ft. throughway, 2.5 ft. frontage
- C-4 with predominantly residential ground floor – 1.5 ft. edge, 8 ft. furnishings (including landscape), 8 ft. throughway, 0 to 1.5 ft. frontage
- C-3 with predominantly commercial ground floor – 1.5 ft. edge, 7 ft. furnishings (including landscape), 6 ft. throughway, 1.5 ft. frontage
- C-3 with predominantly residential ground floor – 1.5 ft. edge, 8 ft. furnishings (including landscape), 6 ft. throughway, 0 to 1.5 ft. frontage
- Result of guidance in relations to Broadway – 9.5 ft. landscape with 8 ft. sidewalk, assume that additional sidewalk width if needed would be part of private development

1e. Pedestrian Crossings: Assume that number of crossings is equal (except that existing conditions would have fewer than any future option); therefore current assessment is about the quality and distance of the crossing

1f. Vehicle / Pedestrian Conflicts at Driveways: Rated Option 4A, and SATA concept, as negative because the sidewalk would be sloped or go down to street grade at the drive access points because of the narrowness of the sidewalk, landscape width and sidewalk width determines ranking of other concepts – more width provides more ability for vehicles to slow and see pedestrians.

2a. Separation of Bikes and Arterial Traffic

- 5 ft. width negative (–)
- 6 ft. width neutral (ITE Manual recommendation)
- 7 ft. width positive (+)

2b. Bike Conflicts with Crossing Vehicles

- Assume all options are neutral for vehicles crossing bike lane to get to curb cuts or dedicated right turn lanes
- Options that require buses to cross over to bus pull outs are neutral.
- Options with dedicated transit lanes in the middle get a single + for that, still would have local buses pulling into bus pull outs.

2h. Bike Crossing: Assume some basic improvements at crossings and more crossings for all concept options, so this gives

- four lane options 1 plus
- six lane options 1 plus (regardless of median width as street crossings will likely be at least 18 ft. wide given turn lane and 7 ft. refuge island width.
- Eight lane options are neutral, except for 6+T B given its large width.

3b. Transit Stop Facilities

Existing facilities are generally poor, although there are a few bus pull outs

- Four lanes get + when have pull outs (except those with wider pedestrian areas get ++) because of lower construction cost may be more budget to improve transit stops; SATA also gets a ++ because of transit platforms for streetcar.
- Six lanes get neutral with pull outs as this is now the regional standard
- BRT in middle of roadway gets ++ because it is assumed that this investment in roadway infrastructure for BRT would mean commitment to high-level of improvements on the platforms

3c. Corridor Travel Time: Existing corridor travel time is lower than existing vehicular traffic travel time, so two negatives rather than the one negative for 4a. Movement of Through Traffic.

- Four and six lanes with pull outs, signal prioritization, etc. are assumed to be slower than vehicular movement, because all buses must pull into bus pull outs and this slows the bus travel time.
- Dedicated transit lanes with accompanying signal prioritization, etc. are assumed to have roughly the same corridor travel time as vehicles, except for where the dedicated lane is outside lane (Option 6+TA), because it

would have issues with right turning vehicles and the BRT may need to use the bus pullouts. Also, SATA is one minus sign less than the vehicular through movement performance measure because at least a portion of the service is in a dedicated lane.

3d. Schedule Adherence: Rough combining of 3b and 3c with a bit more weight to 3c.

3f. Accommodation of Future High Capacity Transit

- Existing and 4 lanes get – ,because they would end up having one lane in each direction for vehicular traffic if dedicated transit lanes were provided
- Six lane options get – because even though these could be converted to 4+T with dedication of lanes, there would likely be resistance to reducing traffic lanes once they are in place and construction would need to occur to make the conversation.
- 6+T A has right turning vehicle issues so ++
- 4+T and 6+T B gets +++, because they provide for high-quality high capacity transit with implementation of the concept
- SATA is rated neutral because only one direction is in a dedicated lane while the service levels are reduced by the other direction running in a shared lane.

4a. Movement of Through Traffic During Peak Traffic Periods–JMS

- Existing section with current volumes - impacts of buses stopping in through lanes and high number of ped HAWK signals (that are not synchronized with other signals), through traffic flow is less than desirable; increased traffic demand for either growth scenario without adding intersection capacity will result in long travel times and excessive delay.
- 4 lane options w/o exclusive transit lanes – do not provide sufficient through capacity at the signalized intersections for either growth scenario. These options assume that additional turning lanes are provided at the key intersections (Euclid, Campbell, Country Club) and bus pullouts and coordinated pedestrian HAWK signals are provided.
- 4-lane options with exclusive transit lanes – through traffic operations will be improved assuming that a sufficient modal shift from car to transit (BRT) occurs to reduce vehicular demand.
- 6 lane options w/o exclusive transit lanes – fair to good through traffic operations depending upon growth scenario; assumed bus pull outs and coordinated pedestrian HAWK signals.
- 6 lane options with exclusive transit lanes – good to very good through traffic operations depending upon growth scenario and assuming that a sufficient modal shift from car to transit (BRT) occurs to reduce vehicular demand.
- The SATA concept is rated lower than the 4 lane mixed flow options because the streetcar shared lanes are estimated to reduce performance for those lanes

5a. Historic Resources and 5a’. Significant Resources: Based on review of relationship to future ROW to existing ROW and distance between building facades.

5d. Gateway to Downtown: Roughly combination of transit and vehicular access and mobility with community character

5f. Walkable Community: Roughly a combination of pedestrian access and mobility and 5a which is impact on properties

5g. Certainty: Roughly a combination of 1a, 1c, 2e, 3f, and 4a.

6c. Heat Island: Assume existing condition is the base “neutral” condition. Slight penalty for more R.O.W. paving with assumption that much of existing area outside of R.O.W. is hardscaped and that new paving could be high albedo

6d. Water Harvesting: Ratio of landscaped to pavement width.

6e. Walkability / Bikeability: Roughly combination of Bicycle Access and Mobility with 5f Walkable Community.

8a. Construction Cost: extent of improvements and investment in transit facilities for dedicated transit lane options.

8b. Acquisition Cost: Width of future r.o.w. and relationship to segment by segment potential for possible acquisition.

Performance Measure Tables

DRAFT resulting from CTF review in

Charrette #1

May 21 & 23, 2013

and further review at the May 30th CTF Meeting

Further proposed revisions by Planning Team

dated **June 11th**

for further CTF review at the June 20th Meeting



Transit Access and Mobility

3c. Corridor Travel Time

Description	<ul style="list-style-type: none"> Time for traveling the length of the corridor affects transit ridership
Measurement	<ul style="list-style-type: none"> VISSIM results accounting for signal timing, transit priority treatments, traffic delay, merges, and boarding time at transit stops Initial assessment based on traffic assessment of current PAG projections and 30% reduced traffic growth option, with qualitative comparisons based on professional experience and judgment of relationship between transit and vehicular travel time
Factors	<ul style="list-style-type: none"> Dedicated lanes, transit priority treatments at intersections, level boarding, off-vehicle ticketing, and other measures
Ability to Effect	<ul style="list-style-type: none"> Moderate to High
Ability to Evaluate	<ul style="list-style-type: none"> Low to Moderate at current level of design (presence of transit only lanes) Other factors require higher level of design and commitments from Sun Tran

Transit Access and Mobility

3f. Accommodation of Future High Capacity Transit

Description	<ul style="list-style-type: none"> • The ability of the roadway and roadside design to accommodate future high capacity transit can ultimately improve performance of design concepts in relation to other transit performance measures • Also affects long term viability of the design concept, see 5g Certainty
Measurement	<ul style="list-style-type: none"> • Provision of dedicated transit lanes • Roadside or median width allows for future transit improvements
Factors	<ul style="list-style-type: none"> • Provision of dedicated transit lanes • Roadside or median width allows for future transit improvements • Potential for future resistance to conversion of mixed flow lane to transit lane
Ability to Effect	<ul style="list-style-type: none"> • High
Ability to Evaluate	<ul style="list-style-type: none"> • Low to Moderate at this level of design <ul style="list-style-type: none"> • Provision of dedicated lanes • Right of way could be increased at transit stops to provide space for facilities • Design does not currently include details of intersection design

Vehicular Access and Mobility

4a. Movement of Through Traffic

Description	<ul style="list-style-type: none"> A range of corridor and intersection evaluations can measure effectiveness of moving through traffic which can have an affect on a variety of other transportation, environment, and economic factors.
Measurement	<ul style="list-style-type: none"> Using VISSIM modeling can measure: <ul style="list-style-type: none"> Average corridor travel time Average speed Average 95 percentile queue length Average delay Average corridor travel time Volume to Capacity Ratio (V/C) Travel time reliability Initial assessment based on assessment of current PAG projections and 30% reduced traffic growth option, with qualitative comparisons based on professional experience and judgment
Factors	<ul style="list-style-type: none"> Number of traffic lanes Signal design Intersection design Access management Transit service design
Ability to Effect	<ul style="list-style-type: none"> High
Ability to Evaluate	<ul style="list-style-type: none"> Moderate at current level of design as only number of traffic lanes and presence of transit only lanes are defined

Sense of Place

5a. Historic Resources

5a'. Significant Resources

5b. Visual Quality

5c. Broadway as a Destination

5d. Gateway to Downtown

5e. Conduciveness to Business

5f. Walkable Community

5g. Certainty



Sense of Place

5a'. Significant Resources

Description	<ul style="list-style-type: none">• The number of significant structures lost due to direct impact• The number of significant structures with limited usefulness as a result of loss of parking, setback, site access, and other conditions
Measurement	<ul style="list-style-type: none">• Count of significant structures lost by category
Factors	<ul style="list-style-type: none">• Roadway width• Streetside area width• Alignment placement
Ability to Effect	<ul style="list-style-type: none">• High
Ability to Evaluate	<ul style="list-style-type: none">• Moderate to High at current level of design• More definitive as intersections and alignment are designed

